

Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claims 1-7 (cancelled)

1 Claim 8 (new) A fluid injection mechanism (12; 12'; 112)
2 including at least one pulse valve (24; 124, 122) for
3 providing high frequency pulses of a fluid medium,
4 comprising:
5 a housing (50; 140, 140'; 240, 240') containing
6 a plenum chamber (74, 174, 274);
7 means (76, 78, 178, 278) for supplying the
8 fluid medium under pressure to the plenum chamber (74,
9 174, 274);
10 a pair of members (40, 42; 140, 142; 240, 242)
11 mutually juxtaposed in close, facing relation and
12 having respective slots (44, 46; 144, 146; 244, 246)
13 therein, one member (42; 142; 242; 40; 140; 240) of the
14 pair of slotted members (40, 42; 140, 142; 240, 242)
15 being mounted to allow limited axial displacement
16 relative to the other, one member (42, 142, 242) of the
17 pair of slotted members (40, 42; 140, 142; 240, 242)
18 being adapted to rotate relative to the other (40, 140,
19 240) to successively align and unalign, and thus port and
20 unport, the slots (44, 46; 144, 146; 244, 246) in the
21 two members, the pair of members (40, 42; 140, 142;
22 240, 242) defining a boundary of the plenum (74, 174,
23 274);
24 means (72; 172) for urging the one member (42;
25 142; 242; 40; 140; 240) of the pair of slotted members

26 (40, 42; 140, 142; 240, 242) capable of said limited
27 axial displacement into close sealing relation with the
28 other member of the pair; and

29 means (70, 54, 52; 194) for rotatingly driving one
30 member (42, 142, 242) of the pair relative to the other
31 (40, 140, 240) at a predetermined speed sufficient, in
32 combination with the slots (44, 46; 144, 146; 244, 246)
33 in the pair of members (40, 42; 140, 142; 240, 242), to
34 provide successive pulses of the fluid medium at a high
35 frequency.

1 Claim 9 (new) The fluid injection mechanism of claim 8
2 wherein said means (72; 172) for urging the one member
3 (42; 142; 242; 40; 140; 240) of the pair of slotted
4 members (40, 42; 140, 142; 240, 242) capable of said
5 limited axial displacement into close sealing relation
6 with the other member of the pair comprise spring means
7 (72; 172).

1 Claim 10 (new) The fluid injection mechanism (12; 12') of
2 claim 9 wherein the pair of slotted members (40, 42)
3 comprise a stationary member (40) fixedly mounted in the
4 housing (50) and a disk (42) rotatably mounted in the
5 housing (50) adjacent to and upstream of the stationary
6 member (40) relative to the direction of the supply of
7 the fluid medium to the plenum chamber (74), the
8 rotatable disk (42) being mounted to allow said limited
9 axial displacement whereby the pressure of the fluid
10 medium also urges the rotatable disk (42) into close
11 sealing relation with the stationary member (40).

1 Claim 11 (new) The fluid injection mechanism of claim 10
2 wherein the rotatable disk **(42)** includes an axially
3 located, shaped seating recess **(71')**, and the means **(70,**
4 **54, 52)** for rotatingly driving the disk **(42)** comprise a
5 rotary motor **(52)**, a drive shaft **(54)** connected to the
6 motor **(52)** and a shaped driver **(70)**, the drive shaft **(54)**
7 including a shaped recess **(68)** extending axially in its
8 distal end, the proximal end of the shaped driver **(70)**
9 being slidably disposed in the shaped recess **(68)** of the
10 drive shaft **(54)** and shaped to prevent rotation relative
11 to the drive shaft **(54)**, the distal end of the shaped
12 driver **(70)** including a shaped head **(71)**, the shaped head
13 **(71)** and the shaped seating recess of the rotatable disk
14 **(42)** being cooperatively shaped for mated rotary driving
15 engagement and limited floating axial and wobble
16 displacement of the rotatable disk **(42)**, and wherein the
17 spring means **(72)** comprise a compression spring disposed
18 in the shaped recess **(68)** of the drive shaft **(54)** and
19 acting on the shaped driver to bias its shaped head **(71)**
20 into the shaped seating recess of the rotatable disk
21 **(42)**.

1 Claim 12 (new) The fluid injection mechanism of claim 9
2 wherein the fluid medium is a gaseous propellant for a
3 pulse detonation engine **(10)**, the opposed facing surfaces
4 of the fixed member **(40)** and the rotatable disk **(42)** are
5 ground to precision flatness and finish to provide
6 respective faying surfaces, and the number of slots **(44**
7 **or 46)** in at least one of the fixed member **(40)** and the
8 rotatable disk **(42)** is at least about ten.

1 Claim 13 (new) The fluid injection mechanism of claim 8
2 wherein the frequency of the successive pulses of the
3 fluid medium provided by the at least one pulse valve
4 (24; 124, 122) approaches or exceeds 100 Hz.

1 Claim 14 (new) The fluid injection mechanism (112) of
2 claim 8 wherein there is included a pair of annular pulse
3 injection valves (124, 122) for respectively providing
4 high frequency pulses of respective different fluid media
5 to a pulse detonation engine (10), the housing (140,
6 140'; 240, 240') containing a pair of respective annular
7 plenum chambers (174, 274) disposed coaxially with the
8 pulse detonation engine (10); the respective different
9 fluid media being supplied to the respective plenum
10 chambers (174, 274) via the respective supply means (178,
11 278); there being two pairs of annular members (140, 142;
12 240, 242), with the annular members of a respective pair
13 being mutually juxtaposed in close, facing relation and
14 having respective slots (144, 146; 244, 246) therein, one
15 member (140, 142; 240, 242) of each pair of slotted
16 members (140, 142; 240, 242) being mounted to allow
17 limited axial displacement relative to the other of that
18 pair, one member (142, 242) of each pair of slotted
19 members (140, 142; 240, 242) being adapted to rotate
20 relative to the other member (140, 240) of that pair to
21 successively align and unalign, and thus port and unport,
22 the slots (144, 146; 244, 246) in the two members of that
23 pair, each pair of slotted members (140, 142; 240, 242)
24 defining a boundary of the respective plenum (174, 274);
25 each pair of slotted members (140, 142; 240, 242) having
26 a respective means (172) for urging the one slotted
27 member (142; 242; 140; 240) of each pair of slotted

28 members (140, 142; 240, 242) capable of said limited
29 axial displacement into close sealing relation with the
30 other slotted member of that pair; and the means (194)
31 for rotatingly driving one slotted member (142, 242) of
32 each pair relative to the other slotted member (140, 240)
33 of that pair at a predetermined speed is operative to
34 drive that respective one slotted member (142, 242) of
35 each of the two pairs (140, 142; 240, 242) in unison.

1 Claim 15 (new) The fluid injection mechanism (112) of
2 claim 14 wherein the pair of annular pulse injection
3 valves (124, 122) are ganged in axially-spaced relation
4 by an annular injector member (120) intermediate and
5 common to the pair of valves.

1 Claim 16 (new) The fluid injection mechanism (112) of
2 claim 15 wherein the annular injection member includes a
3 lobed mixing tang (190) to assist in directing fluid
4 pulse flow.